

PROVINCE OF SASKATCHEWAN  
DEPARTMENT OF AGRICULTURE

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## Dry Farming in Saskatchewan

Extracts from an address delivered by the Honourable  
W. R. Motherwell, Minister of Agriculture, before the  
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In the pioneer days of Saskatchewan scores and hundreds of settlers left the country believing that no solution of this problem was within the realm of probability; but, as has often previously proven the case, "necessity was the mother of invention," and the sturdy pioneer farmers of those days, assisted by the experimental farms and agricultural press, demonstrated very clearly that our strong, retentive, heavy clay soil was capable of producing good crops with very much less, even, than seventeen inches of annual precipitation. While this is true, it must be admitted that this could not be done year after year in succession without stopping at varying intervals of three or more years, and storing up moisture under a system of approved and improved modern summer tillage (commonly called summerfallow) that will be alluded to later.

Some writers have undertaken to lay down a hard and fast rule with regard to the best method of tillage to pursue under semi-arid conditions; but, so far as Saskatchewan is concerned, such rigidity applied to our varying soils, altitudes, exposures, precipitation and climatic conditions would only lead to loss and disappointment. Variations in method must and can be pursued without departing from principles, and herein lies the importance of every farmer understanding something of the science of soil physics in order to have the ability to prescribe such crops and tillage methods as will meet the requirements of his particular farm, just as a physician prescribes to suit the individuality of his patient.

### *The "Dry Farm" Summerfallow.*

The modern summerfallow was introduced into Saskatchewan over twenty-five years ago, not for the purpose of renewing a worn-out soil, as was once commonly thought, but for the purpose of getting the soil into the best condition to absorb moisture and then holding it there for the use of succeeding crops. Thus the shortage in each year's precipitation was overcome and full crops ensured. In order to do this thoroughly and most effectively in Saskatchewan it was found that the land intended for fallow after receiving some form of fall tillage, should be ploughed as early as possible in the spring after seeding that it might be in the most receptive condition to fully absorb and save from waste all the early and later rains. This should be immediately followed by surface tillage to put the necessary nonconducting soil mulch on the

top, to intercept capillary movement, and prevent loss of moisture by evaporation. By this system the soil, if thoroughly and intelligently handled, will be found moist to a depth of five or six feet, and a sufficient amount of moisture for the growing of at least two successive crops is secured, even though drought should occur. This system was practised for many years and is to a large extent in vogue yet.

### *The Summerfallow is Wasteful.*

But with the passing of time, cheap land, root fibre and humus, many advanced and thinking farmers are now searching for a more economic, permanent and less extravagant system of farming. The profitable returns under this method have caused land values to increase rapidly, so that now it seems a waste of capital to have one-third the tillable acreage idle each year. Furthermore, this system, while restoring nothing to the soil, rapidly dissipates its humus, and thus, as the years go by, reduces its capacity to absorb and retain moisture. While summerfallowing is recognised yet as the very foundation stone of successful agriculture in Saskatchewan, still it can and will, I believe, be supplemented by other intelligent tillage methods which will lengthen the time between fallowing seasons and obviate the necessity of such a large acreage being idle each year. If the care that is put on summerfallow to conserve moisture be followed up in each succeeding year by fall discing immediately the harvest has been taken off, and by a more generous use of the diamond harrow at every available opportunity—even in many cases after the grain is up in the spring, and by packing, the reserve of moisture in fallow could be made to extend over a much longer period than two years. Instead of summerfallowing a quarter section five inches deep every third year, would it not be more economical to fallow one-half that amount say ten inches deep, thus assuredly storing up a much larger amount of moisture and extending its benefits over a longer term of years? The more frequent use of the disc and drag harrow before referred to would not only help to control evaporation but also kill innumerable weeds that frequently prove such a continual drain on the soil moisture. To plough ten inches deep could only be advantageously done in Saskatchewan by subsoiling, and this will be referred to under the next heading.

### *Principles Governing Depth to Plough to.*

Too much indiscriminate advice to plough deeply under all circumstances in Saskatchewan would be unwise and misleading, and must meet with disappointing results; but that all clay soils should be stirred deeply at least once after being broken up is becoming more and more apparent. Deep ploughing to increase the soil's capacity to store moisture at intervals of say ten or twelve years, to be followed by shallow ploughing or surface tillage in intervening years to hasten early maturity, is now thought to be the ideal method in many localities. The danger of too frequent deep ploughing is obvious. Should it be followed by a dropping season the growth of straw will be too rank, and maturity retarded, which tends to run the crop into the period of early fall frosts before harvesting is completed. Nevertheless deep tillage is necessary to provide against drought particularly, and will be accompanied by

the risk of slow maturity only in the first succeeding crop. This risk could be offset by special attention to packing and growing for the first year crops suited to such a condition of soil. During the subsequent eight or ten years the land should be ploughed to a normal depth of say four to five inches, which will tend to hasten maturity and yet provide a satisfactory seed-bed.

I believe that subsoiling will become in time a recognised necessity, particularly in our heavy clay soils that are under shallow tillage, comparatively impervious to moisture. Under present conditions a great deal of the copious rainfall of June and early July runs off into adjoining sloughs, creeks and coulees and is lost, whereas if subsoiling had been performed even once this excess of rain would freely percolate into the soil as it fell and remain there in reserve to be drawn upon during a period of subsequent possible drought. This is one way whereby all of us may assist in conserving one of the most important natural resources of our semi-arid open plains—the rain and snowfall.

#### *Depth at Which to Sow Seed.*

We do not know who is responsible for teaching the agricultural heresy that sowing deeply insures the crop against drought. The argument implies that a shallow rooting plant can be converted into a deep rooting one simply by planting deeply. But anyone who has given any attention to cereal growth must have noticed that any of the small grains, if planted in a moist soil deeper than about two and one-half inches, will, immediately upon showing the surface growth, assert its shallow growing tendencies by throwing out a new set of rootlets about one and one-half or two inches below the surface or immediately below the moisture line. Thus with us it is a mistake to sow too deeply with the idea that such a practice assists in resisting drought. In addition, too, this too deep sowing has other serious disadvantages, such as delayed germination, disposition to smut, tardy maturity and a weakened vitality of the plant generally.

#### *Quantity of Seed to Sow Per Acre.*

All the best thinkers in the dry farming world claim that better results can be secured from moderately thin than from thicker sowing. The usual reasoning of those who support thick sowing as being best in dry countries is that it will produce a heavy thick foliage, which by quickly and thoroughly shading the ground economises and conserves much moisture. But a little inquiry into this popular fallacy will soon dispel it. Recognising that the moisture supply is our limiting factor in crop production, with a given amount in a cubic yard of land it is obvious that, say fifty plants, will exhaust that moisture more quickly than a lesser number would do, as each plant is a miniature suction pump continually drawing upon the soil moisture and evaporating it through its leaves. This process is accelerated by the dry winds which sometimes blow during the hot summer. Given, however, a good reserve of moisture in the land and a reasonable number of plants thereon, the ill effects of such drying winds are not only averted but turned to good account by stimulating rapid maturity. Were the cubic yard of soil

in question loaded with one hundred plants instead of fifty it is evident that its moisture would be exhausted in about half the time, and that the supply would be insufficient to meet the heavy demands made upon it during a period of drying winds and excessive evaporation. On the other hand, if the cubic yard of soil has been deeply worked in a district where the soil is peculiarly retentive of moisture and precipitation is unusually generous, too thin sowing would induce excessive stooling and correspondingly delayed maturity, both of which must be avoided in Saskatchewan.

What then should govern us in the amount to sow? If our previous reasoning is correct, that thick sowing is likely to be more susceptible to damage by drought, while too thin sowing runs one into danger by frost, this is a question in the solving of which the tiller of the soil will require to exercise sound judgment, based upon local conditions. As much discretion as would be used in loading a team for a trip to market should be exercised in determining the amount of seed to be sown on an acre of land, for as many factors enter into the question. Just as the weight, condition and temperament of the team, the nature of the load and condition of the wagon, the character of the trail, its present condition, its length, and the weather on the day in question, all enter into the decision as to what load shall be hauled, so the mechanical condition of the field, its probable reserve of moisture, the stage to which the season has advanced, the presence or absence of weeds, and the variety of seed being used are among the factors that must be considered by the careful farmer when he is determining the quantity of seed he will sow to the acre. In short, land should be sown according to its known capacity to carry a large or small crop. Experience has demonstrated that in Saskatchewan the quantity of wheat to be sown per acre should vary from three pecks to two bushels, of oats from six pecks to three bushels, and of flax around two pecks.